

[0066] FIGS. 5A through 6E are plan views illustrating various shapes of a conductive plate according to one or more embodiments.

[0067] Referring to FIGS. 5A and 5B, the conductive plate has a cutout part 140. The cutout part 140 may be formed in a region corresponding to a winding center of the coil wiring 21 illustrated in FIG. 4. Accordingly, an electromagnetic field may be formed through a center region of the coil wiring and the cutout part 140, thereby improving efficiency of wireless transfer.

[0068] Referring to FIGS. 6A through 6E, the conductive plate 100 has various shapes depending on a size and a shape of the wireless transfer coil. The conductive plate may have a circular shape as illustrated in FIG. 6A, and the conductive plate may include a cutout part as illustrated in FIG. 6B.

[0069] Further, as illustrated in FIGS. 6C and 6D, the plurality of conductive tiles included in the conductive layer of the conductive plate may be radially arranged.

[0070] Further, as illustrated in FIG. 6E, the cutout part of the conductive plate is filled an insulating layer or an insulating member.

[0071] FIGS. 7 and 8 are perspective views illustrating an example of a conductive plate which is integral with the cover of a portable terminal, while having the conductive plate and the electronic device illustrated in FIGS. 1 through 6E as a basic configuration. Therefore, in order to avoid unnecessary overlaps in descriptions, a detailed description of the contents which are same as or similar to those described above will be omitted, and components which are same as or correspond to the component described above will be denoted by the same reference numerals.

[0072] Referring to FIG. 7, a cover 700 includes a protective layer 710 and a conductive layer 720. The protective layer 710 forms an outer surface of the electronic device. A method for forming the protective layer 710, a configuration of the protective layer 710, and a function of the protective layer 710 are the same as those described above with reference to FIGS. 1 through 6E.

[0073] The conductive layer 720 may be formed of a metal material having a plate shape. The conductive layer, which may be a metal case of the portable terminal, may be coupled to the device body. Further, the conductive layer 720 includes a plurality of conductive tiles 721 in some regions corresponding to the wireless transfer coil. Although FIG. 7 basically illustrates the embodiment illustrated in FIG. 6C, the plurality of conductive tiles 721 may have various shapes and layouts as illustrated in FIGS. 6A through 6D.

[0074] Further, an insulating member 730 may be inserted between the plurality of conductive tiles 721 and in outer spaces of the plurality of conductive tiles 721.

[0075] Further, the conductive plate may include a cutout part 740 as illustrated in FIG. 6B. The cutout part may be formed in a region corresponding to the winding center of the wireless transfer coil.

[0076] The cutout part 740 may be covered by an insulating layer, or may be filled with the insulating member 730.

[0077] Further, as described above with reference to FIG. 3, the insulating member may be coated to cover one surface of the conductive layer 720, and may serve as a protective layer 710 protecting the conductive layer 720.

[0078] Referring to FIG. 8, the portable terminal includes the device body 40, a coil substrate 20', and the cover 700. A coil wiring 21' formed on the coil substrate 20' may be

electrically connected to the device body 40. Although one or more embodiments illustrate a case in which the coil wiring 21' is formed in a circular spiral shape, by way of example, various shapes may be possible.

[0079] The cover 700 couples to the device body 40 as a rear cover or a battery cover covering one surface of the coil wiring 21'. Accordingly, there the cover of the portable terminal may be capable of significantly reducing the current loss by preventing the formation of the eddy currents in some regions corresponding to the wireless transfer coil using the plurality of conductive tiles, and decreasing a temperature of a hot spot by diffusing thermal energy of the wireless transfer coil.

[0080] FIGS. 9A through 9D are views illustrating an example of a method for manufacturing a conductive plate.

[0081] Hereinafter, an example of a method for manufacturing a conductive plate will be described with reference to FIGS. 9A through 9D. However, an order of manufacturing operations may be changed.

[0082] First, as illustrated in FIG. 9A, a metal plate is provided as a conductive layer 120, and as illustrated in FIG. 9B, a plurality of conductive tiles 121-1 to 121-N having a space therebetween are formed by a cutting or etching operation. As illustrated in FIG. 9C, an insulating member 130 is formed on the conductive layer 120. A first member 130a of the insulating member 130 is formed in the space between the plurality of conductive tiles 121-1 to 121-N. Further, a second member 130b of the insulating member 130 is coated onto the conductive layer 120 to cover a top surface of the conductive layer 120.

[0083] As illustrated in FIG. 9D, an insulating layer 110 may be formed by anodizing a bottom surface of the conductive layer 120.

[0084] As set forth above, according to the embodiments, the cover and the portable terminal including the same may significantly reduce the current loss by preventing the formation of eddy currents, whereby the wireless transfer efficiency may be maintained and the radiation and dissipation of heat may be effectively performed.

[0085] As a non-exhaustive example only, a portable terminal as described herein may be a mobile device, such as a cellular phone, a smart phone, a wearable smart device (such as a ring, a watch, a pair of glasses, a bracelet, an ankle bracelet, a belt, a necklace, an earring, a headband, a helmet, or a device embedded in clothing), a portable personal computer (PC) (such as a laptop, a notebook, a subnotebook, a netbook, or an ultra-mobile PC (UMPC)), a tablet PC (tablet), a phablet, a personal digital assistant (PDA), a digital camera, a portable game console, an MP3 player, a portable/personal multimedia player (PMP), a handheld e-book, a global positioning system (GPS) navigation device, or a sensor, or a stationary device, such as a desktop PC, a high-definition television (HDTV), a DVD player, a Blu-ray player, a set-top box, or a home appliance, or any other mobile or stationary device capable of wireless or network communication. In one example, a wearable device is a device that is designed to be mountable directly on the body of the user, such as a pair of glasses or a bracelet. In another example, a wearable device is any device that is mounted on the body of the user using an attaching device, such as a smart phone or a tablet attached to the arm of a user using an armband, or hung around the neck of the user using a lanyard.